

BASS BEACH

Water Quality Report Summer 2008



**Bass Beach, North Hampton
Water Quality Report
Summer 2008**



**Prepared by:
Carolyn Merrifield, Jessica Devoid,
Teresa Ptak, Sonya Carlson & Jody Connor
Water Division**

**29 Hazen Drive, PO Box 95
Concord, NH 03302-0095
(603) 271-3503
www.des.nh.gov**

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**Thomas S. Burack, Commissioner
Michael J. Walls, Assistant Commissioner
Harry T. Stewart, Water Division Director**

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History of the Beach Program

The New Hampshire Department of Environmental Services (DES) recognizes a public health threat may exist within recreational waters and tests the water at the state's beaches to ensure swimmers are not exposed to disease-causing pathogens or cyanobacteria scums. The DES has operated a Public Beach Inspection Program, commonly called the Beach Program, for over 20 years.

The New Hampshire coastal beach monitoring program was initiated in 1989 with the DES inspecting five beaches. In October 2000, the United States Congress amended the Clean Water Act to include the BEACH Act. The Environmental Protection Agency (EPA) was now authorized to award grants to eligible states to develop and implement monitoring and notification programs. These programs protect the public from exposure to pathogenic microorganisms in coastal recreation waters.

The DES first received grant funds in 2002. Since then the New Hampshire Beach Program has successfully met all of EPA's performance criteria requirements (*National Beach Guidance and Required Performance Criteria for Grants*) and continues to expand the monitoring and notification program. Weekly summer monitoring throughout the state was conducted at nine beaches in 2002, and has since doubled to 16 by 2008. The Beach program strives to expand sampling to include all coastal New Hampshire beaches.

Coastal beaches are monitored for the presence of the fecal bacteria *Enterococci* which are present in the intestines of warm-blooded animals including humans. Fecal bacteria, when present in high concentrations and ingested, can commonly cause gastrointestinal illnesses such as nausea, vomiting and diarrhea. These indicator organisms signify the possible presence of other potentially disease-causing organisms in the waterbody.

Beach monitoring and bacteria source tracking have been implemented to protect public health. In a collaborative effort, the DES Beach program, towns, beach managers, recreational directors and health inspectors encourage public awareness of sources of pollution and environmental responsibilities. Thank you for your interest and concern in New Hampshire's water quality.

Beach Statistics

Bass Beach, located on Route 1A, is owned and maintained by the town of North Hampton.

Bass Beach is a 1,220-foot long rocky beach. The beach is used by the public for walking, sunbathing, and surfing. There is one access point to the beach area from the road (Figure 1). Lifeguards are not present throughout the summer, nor are toilet facilities available.

Waterfowl are not frequently observed at the beach, although ducks and plovers are occasionally observed. There are restrictions for dogs on the beach, yet dogs were observed on Bass Beach during nine inspections this summer.



Figure 1. Bass Beach Access Points and Restroom Facilities.

Assessing Your Beach

Sampling Frequency and Location

The Beach Program developed a risk-based beach evaluation process and tiered monitoring approach during the 2003 beach season based on the EPA performance criteria. Beaches are evaluated annually to determine potential health threats to the public. Evaluations are based on several criteria within three main categories: beach history, microbial pathogen sources, and beach use. Beaches are now assessed as impaired for bacteria based on the most recent version of the Consolidated Assessment and Listing Methodology (CALM). The CALM assesses beach units as impaired based on historical exceedances of both the single sample and geometric mean bacteria standards. This report is submitted to EPA every two years.

Based on the evaluations, beaches are assigned a Tier I, Tier II, or Tier III status. Tier I beaches are considered “high priority” and have an increased potential to affect public health. Tier II beaches are “medium priority” and Tier III are “low priority” beaches that have less potential to affect public health. Beach sample frequency is based on Tier status; Tier I beaches are sampled twice per week, Tier II beaches are sampled once per week, and Tier III beaches are sampled every other week.

The number of samples collected at each beach is determined by the beach length. Beaches less than 100 feet in length are sampled at left and right locations one-third of the distance from either end of the beach. Beaches greater than 100 feet in length are bracketed into thirds and sampled at left, center and right locations. Routine sample collection may be enhanced by sampling known or suspected pollution sources to the beach area. Storm event sampling may be conducted at beaches where watershed runoff resulting from rainfall is expected to impact beach water quality.

Bass Beach is a Tier I beach indicating high priority, necessitating sampling twice each week. Beach sampling increased from once a week to twice a week in 2005 as a result of increased bacteria levels and a posted advisory in 2004. Bass Beach samples are collected at the left, center, and right stations (Table 1). All stations are evenly distributed along the shoreline (Figure 2) and can be accessed via the entrance to the beach from Route 1A. (Figure 1). Additional samples were also collected from Chapel Brook, which is south of Bass Beach (Table 1).

Table 1. Bass Beach Station Descriptions and Latitude/Longitude Points.

Station Description	Latitude	Longitude
Left Sample Station: Located about 25 feet to the south of the entrance.	42° 58' 9.2245"	-70° 46' 15.5233"
Center Sample Station: Located about 50 feet south of the left sample station.	42° 58' 7.3096"	-70° 46' 17.5759"
Right Sample Station: Located about 50 feet south of the center sample station.	42° 58' 4.2269"	-70° 46' 19.3622"
Chapel Brook Station: On the west side of Route 1A, upstream of the culvert that goes under 1A toward the beach.	42° 57' 57"	-70° 46' 19"



Figure 2. Bass Beach Monitoring Stations.

Coastal Water Quality Standards and 2008 Results

Beaches are monitored to ensure compliance with State water quality standards. Marine waters are analyzed for the presence of the fecal bacteria *Enterococci*. *Enterococci* are known as indicator organisms, meaning their presence may indicate the presence of other pathogenic organisms. The State standard for *Enterococci* at public beaches is 104 counts/100 mL in one sample, or a geometric mean of 35 counts/100 mL in at least three samples collected over sixty days. When samples exceed the standard, a beach advisory is issued, at which point the beach manager is notified and signs are placed at the entrances to the beach to warn the public of the potential health threat posed by water contact at the beach. Beach advisories remain in effect until subsequent beach sampling indicates safe water quality conditions.

The 2008 sampling season began May 27th. The sampling season encompassed 96 days. Precipitation was recorded on 32 days over the summer (based on Seabrook Power Station recorded precipitation). June wetfall totaled 1.85 inches while July and August yielded 4.48 and 3.26 inches of rain respectively.

At Bass Beach, 28 routine inspections were conducted throughout the summer of 2008, with three additional inspections conducted in September. One hundred and five *Enterococci* samples were collected from the beach and known point sources (Appendix B).

Overall, the 2008 summer *Enterococci* levels were low and within the State's standards for Bass Beach (Figure 3) with no advisories issued. However, Bass Beach did see elevated bacteria levels on a few occasions this summer. On July 24, sample results revealed *Enterococci* values of 100 counts/100 mL, 90 counts/100 mL, and 50 counts/100 mL at the left, center, and right sampling stations respectively. These high counts were likely due to the 2 inches of rainfall in the previous 24 hours that was likely associated with extreme weather created by a tornado that touched down less than 50 miles west of the beach. An elevated *Enterococci* level of 110 counts/100 mL was also recorded at the right station on July 31. By the time the beach was re-sampled, bacteria levels had decreased below the State standard.

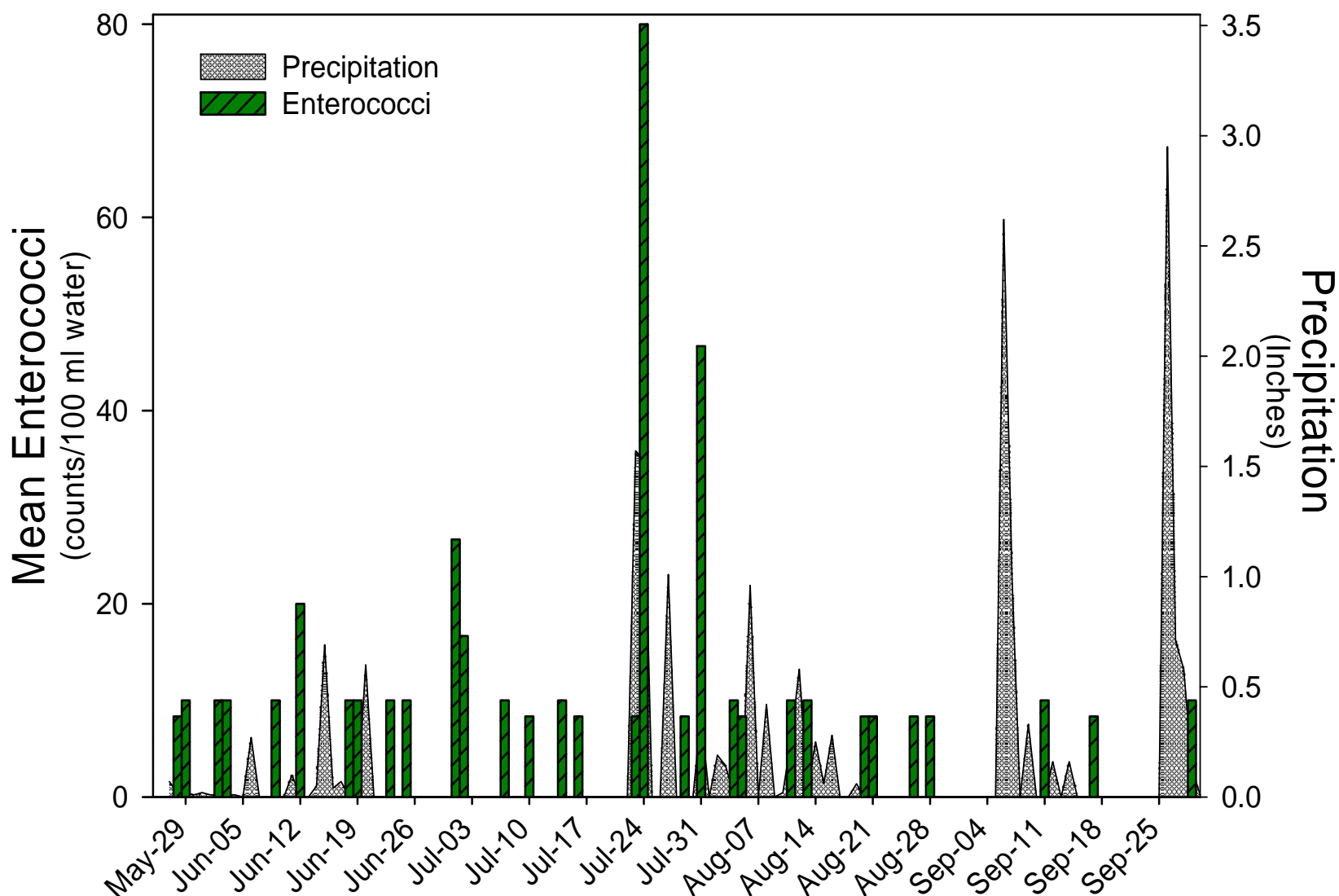


Figure 3. Bass Beach 2008 mean Enterococci results. No advisories were posted at Bass Beach in summer 2008 because all results were below the state standard for Enterococci of 104 counts/100 ml of water. The elevated rainfall in September did not lead to increased bacteria values. See Appendix B for all results from all stations for the 2008 sampling season.

Bass Beach Adopt-a-Beach Program

In response to growing concern over the amount of litter and marine debris impacting visual and environmental aspects of New Hampshire's beaches, the Beach Program partnered with the Portsmouth based Blue Ocean Society for Marine Protection. Both parties met in the spring of 2005 to discuss the development of an Adopt-a-Beach Program. The Blue Ocean Society agreed to add Bass Beach to their Adopt-a-Beach Program and the Beach Program agreed to supply all necessary materials for adopting Bass Beach.

Volunteers conduct beach clean-ups about once per month and record items found on data cards. The litter is discarded into trash bags and weighed at the end of the clean up. The items recorded on data cards are tallied and sent to the Blue Ocean Society where the numbers are entered into spreadsheets and summarized for the year. Seven clean-ups were conducted at Bass Beach in 2008. The most numerous items found were fishing nets, line, and rope, and metal beverage cans. The combined weight of trash collected was 260 pounds.

Concerns

Chapel Brook is within the watershed of the Bass Beach/Philbrick Pond salt marsh located along the border of North Hampton and Rye. The brook is the final discharge of the salt marsh and contributes to increased bacteria levels measured at Bass Beach. A water quality investigation conducted in 2006 isolated the main bacteria sources to Chapel Brook (Chapel Brook Special Study, North Hampton, NH, S. H. Jones, 2008). Among these are Chapel Brook Pond, located upstream, as well as a tributary to the pond, and a stream draining a residential area bordering the golf course on Old Locke Road. The increased Enterococci load from these waterbodies is discharged at the Bass Beach area and poses a potential public health threat to those swimming at the beach. The final report is available on the DES website at the following address: http://des.nh.gov/organization/divisions/water/wmb/beaches/beach_reports/index.htm

Chapel Brook was sampled 13 times this summer. The Enterococci levels were relatively low with a few high spikes resulting after periods of precipitation. The brook was usually sampled at low tide. Sampling conducted at high tide may result in ocean backflow that potentially dilutes the water and decreases the bacteria count. Enterococci levels were highest at Chapel Brook on July 24, 2008 (Figure 4, Appendix B).

Dogs were observed in the beach area during nine separate inspections this year, despite the fact that Bass Beach does not allow dogs during regular beach hours. The DES recommends that the town enforce the animal ordinance. Not only do pet feces on the beach pose a health threat to beach-goers, pet wastes may also increase the potential for beach advisories, as they are bacteria sources to swimming areas.

The Beach Inspector discovered a dead seal on Bass Beach in July. Beach Program personnel reported the animal to the New England Aquarium. The DES Beach Program staff will be meeting with the NEA and others in early 2009 to determine a protocol for stranded marine mammals. Beach managers will be informed of any relevant issues.

Future Projects

- The DES Beach Program encourages participation between the town of North Hampton, local businesses, or school groups and the Adopt-a-Beach Program. The program promotes beach clean-ups and water quality monitoring. The DES would conduct training sessions and participate in education and outreach activities for the community.
- The beach management should consider installing dog waste receptacles and bags to reduce the amount of fecal contamination to the beach. The Beach Program has funds available to supply towns with pet waste receptacles.
- The Town of North Hampton should implement remediation activities along Chapel Brook as recommended by the Chapel Brook Watershed Investigation Final Report.

If you are interested in the Adopt-A-Beach program, dog waste reduction strategies, or obtaining a copy of the Chapel Brook Final Report, please contact Sonya Carlson at (603) 271-0698 or **sonya.carlson@des.nh.gov**.

Appendix A: 2008 Special Report – Stormwater Modeling

When rain falls over the land, it flushes bacteria and other contaminants that have accumulated on the landscape to our beaches. As impervious areas like pavement and buildings are constructed in a subwatershed, more runoff contaminants are carried to our beaches. In addition to increased impervious cover as a result of land use changes, New Hampshire has recently experienced substantial and prolonged wetfall events. With increased flushing of the landscape combined with expanded impervious cover, it is imperative for local and state governments to explore new management techniques to protect New Hampshire beaches from contaminant sources.

DES Beach Program monitors New Hampshire coastal waters for potentially pathogenic bacteria. The DES has been monitoring these beaches since 1989 and has amassed large amounts of bacterial information for most coastal beaches. This collected information over the past years can be used to predict bacteria counts that can be expected with present and future development.

The DES Beach Program is proactive and always researching new management practices that can improve beach quality and new techniques to accelerate the beach advisory notification process. Beach Program personnel sample coastal beaches 4 days a week. Advisories are issued once state bacteria standards are exceeded. Despite our protective efforts, at least 24 hours pass from sample collection to bacteria count determination. During this time DES and swimmers are unaware of bacteria levels. The period of time between monitoring and sample analyses certainly put swimmers at risk for potential illness.

Two important Beach Program goals are to determine watershed contribution of bacteria to coastal beaches and to predict bacterial concentrations during and after a rain event. Mathematical models can be used to ascertain categories of bacteria sources and to predict bacteria concentrations after a rain event. Such models are complex and require a great deal of expertise and technical skill. The DES has selected FB Environmental to utilize an appropriate model and to train Beach Program personnel how to apply the model. With detailed predictions of how wetfall will affect bacteria transport to coastal beaches, future buildout planning, mediation, and construction could be guided by a stormwater model. The DES hopes the model will provide a useful tool for town officials and law makers to improve public notification and protect public health.

With the ability to predict public beach bacterial concentrations DES could immediately post an advisory based on predicted values and conduct follow up sampling for verification. A predictive model would allow advisories to be posted as soon as a public health threat occurs. Collecting samples during times of predicted high bacteria levels will help DES verify the accuracy and precision of the model. A model can be an effective tool in helping us achieve our mission to protect the public from exposure to waterborne illness while enjoying New Hampshire waters.

In addition to coastal bacteria data, the model will incorporate land use categories, hydrology, topography, historical precipitation records, historical tide data, and waste management. The data collection effort for this project has been time consuming and required help from several sources outside the DES. The DES would like to thank the National Oceanic and Atmospheric Association, the National Climatic Data Center, the Seabrook Nuclear Power Station and the Pease Air National Guard Base Weather Station for providing data. The model is only as good as the data we input, so we strive for the best quality controlled verified data available. The project is due for completion in early 2009.

Appendix B: Bass Beach 2008 Data by Date

Date	Enterococci (count/100 mL)				Tide Height (feet)	Rainfall in previous 24 hours (inches)	Number of bathers	Animal Presence
	Left	Center	Right	Chapel Brook				
5/28/08	< 10	< 10	< 5	< 10	1.39	0.09	0	0
5/29/08	< 10	< 10	< 10	< 10	1.84	0.01	0	0
6/2/08	< 10	< 10	< 10		9.3	0.01	0	0
6/3/08	10	10	< 10		9.21	0.01	5	0
6/9/08	< 10	< 10	< 10	10	0.23	0	0	0
6/12/08	40	< 10	10	10	4.41	0	0	1 dog
6/18/08	< 10	< 10	< 10	< 10	7.19	0	0	6 ducks
6/19/08	< 10	< 10	< 10	< 10	6.93	0	2	0
6/23/08	< 10	Unavailable	< 10	100	1.65	0	0	0
6/25/08	< 10	< 10	< 10	110	0.74	0	2	1 dog
7/1/08	20	50	< 10		8.8	0	4	0
7/2/08	10	30	10		8.83	0	2	0
7/7/08	< 10	< 10	< 10	< 10	0.65	0	0	0
7/10/08	< 10	< 10	< 5	< 10	1.26	0	0	0
7/14/08	< 10	< 10	10		7.2	0	8	1 dog
7/16/08	< 5	< 10	< 10		7.49	0	8	0
7/23/08	< 10	< 10	< 5	20	2.22	0	0	0
7/24/08	100	90	50	1070	0.82	2.18	0	0
7/29/08	< 10	< 10	< 5		7.66	0	0	Dead seal on beach until 8/13/08
7/31/08	20	10	110		9.4	0.01	0	0
8/4/08	10	< 10	< 10	210	3.73	0.14	0	1 dog
8/5/08	< 10	< 10	< 5		3.64	0.01	0	1 dog
8/11/08	< 10	< 10	< 10		4.91	0.03	0	0
8/13/08	< 10	< 10	10		7.69	0.17	0	3 plovers
8/20/08	< 10	< 10	< 5		4.49	0.06	0	0
8/21/08	< 10	< 10	< 5		2.36	0	0	0
8/26/08	< 10	< 10	< 5		5.01	0	0	0
8/28/08	< 10	10	< 5		8.34	0	0	1 dog
9/11/08	< 10	< 10	< 10		6.58	0	0	1 dog
9/17/08	< 10	< 10	5		9.88	0	0	1 dog
9/29/08	< 10	< 10	10		9.9	0.37	4	1 dog